



Tanzania's Small-Scale Sunflower Farmers: Upgrading the Value Chain

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Abstract

A questionnaire using a psychometric scale investigated how small-scale sunflower farmers perceive the role of building relationships based on demand-driven upgrades, such as knowledge, skills, technology, and support services within the value chain. The study focused on small-scale sunflower farmers in the Singida region of Tanzania. The survey was conducted in twelve Agricultural Marketing Cooperatives (AMCOs) with 229 respondents.

The respondents had positive opinions about creating core competencies, concluding that adopting new capabilities, especially with tangible assets such as extension officers, financing, warehouses, and technology, can lead to improved productivity and quality. The information flow from sunflower buyers and consumers is crucial for creating a positive image and hence creating value for farmers. Farmers require negotiating skills that could be attained through improved associations or cooperatives. Respondents also indicated positive benefits if the sector—and its risks and income—further diversifies. However, farmers showed weaknesses and failures to:

- Provide inputs to the sector's upgrading processes;
- Form strong, capable, and cohesive associations or cooperatives that can enhance bargaining power for small-scale farmers;
- Improve infrastructure such as roads and warehouses.

Keywords: Edible oils, value chain, relationships, linkages and upgrading.

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1. Introduction

This paper seeks to set up the assessment on the upgrading of the sunflower value chains by the Tanzania's small scale farmers. In particular, the paper introduces the state of sunflower production by looking at areas and the quantities being produced. The study looks at the concepts and theory of upgrading and in particular its relationships with technology and information technology. The paper further highlights the empirical studies on the theory and concepts of upgrading. The paper ends with research methodology by giving an overview of the operationalized constructs, data collection, findings, discussions and data analysis. Finally, the paper provides interpretations and conclusions about the study.

1.1 The Sunflower sub sector in Tanzania

The sunflower sub-sector represents one of the key agricultural subsectors in Tanzania. It produces one of the most important and valuable vegetable oils on the international market, ranked fourth after soybean, palm, and rapeseed oils. The Ministry of Agriculture [1] reported the total production of sunflower seeds in 2004-05 to be 134,360 metric tons (MT). The economic survey report (2009) puts production at 369,803 MT in 2007, 418,317 MT in 2008 and 466,831MT in 2009. However, a finding from a survey that was conducted by Tanzania Edible Oilseeds Actors Ltd [2] reports that production in 2012 was 792,000 MT. In the past fifteen years there has been an erratic trend in the production of oilseed in the country. Factors attributed to this trend included poor producer prices, the collapse of domestic and export marketing systems, and weak research and extension services [3]. In Tanzania, oil extracted from sunflowers by local producers contributes 40% of the national cooking oil requirements [4]. The development of this subsector in Tanzania has been triggered by two main factors:

- Food value: sunflower is grown for its edible oil production.
- Low technology: farmers have limited processing ability.



Figure 1 Location of study area in Tanzania

Table 1 Sunflower production for selected regions in Tanzania (metric tons in '000)

S/N	REGION	2000/01	2001/02	2002/03	2003/04	2004/05	2007/08
1	Arusha	-	7.40	0.44	0.06	0.11	1.187
2	Dodoma	-	0.6	6.58	34.64	16.66	56.086
3	Iringa	-	16.30	7.30	63.48	12.21	21.161
4	Kagera	-	-	0.10	0.02	0.02	0.028
5	Kilimanjaro	-	-	3.72	2.80	0.29	2.590
6	Manyara	-	-	6.37	12.11	5.01	29.244
7	Mara	10.50	-	0.01	0.35	0.19	0.306
8	Mbeya	4.69	1.42	1.81	1.71	2.75	10.131
9	Mwanza	-	-	0.03	0.07	0.02	00.486
10	Morogoro	0.56	0.60	0.13	5.15	2.04	3.103
11	Rukwa	32.12	26.18	6.10	49.96	21.01	27.425
12	Ruvuma	-	0.01	0.40	1.54	1.45	2.841
13	Shinyanga	7.80	8.80	0.46	2.57	2.84	3.290
14	Singida	25.20	42.50	21.34	72.64	67.00	68.297
15	Tabora	-	0.63	0.15	0.74	0.89	11.802
16	Tanga	-	0.01	0.03	0.60	1.87	0.337
	Total	80.87	104.40	55.04	247.84	134.36	238.314

Source: Ministry of Agriculture (2012)

2. Upgrading

Upgrading is defined as the ability of the firm to make better products, make them more efficiently, or move to more skilled activities in the value chain [5]. Mitchell, Coles, and Keane [6] define upgrading as a process to acquire the technological, institutional, and market capabilities that allow resource-poor rural communities to improve their competitiveness and move to higher level activities. It is a collaborative action undertaken by all actors in a value chain [7]. It regularly establishes clear standards and goals and is communicated among actors

in order to ensure that safety hazards and quality defects are clearly identified and adequately controlled. Value chain upgrading requires the timely recognition, understanding, and interactive communication of process and product among all players in the chain. The value chain theory strongly supports the positive role that lead firms play along the chain in assisting other actors to engage in industrial upgrading.

According to the United Nations Industrial Development Organization [8], upgrading provides credits to global value chains for accelerating the development of enterprises and for developing countries to exploit and upgrade their capabilities. The actors, such as enterprises or local clusters of enterprises, require insertion into the wider networks of global value chains. To attain world standards takes discipline and an initial base of technological capability built through purposive innovation and learning. These efforts are worthwhile because they offer access to markets and knowledge of players in the world economy. The World Bank [9], broadly discusses agricultural innovation systems (AIS) in Africa as an important approach to promoting the agricultural sector. The approach incorporates various actors who tap into the growing stock of global knowledge, and then assimilate and adapt knowledge to local needs. Innovation can happen in areas related to technology, new organizations and partnerships, processes, products, and marketing. To promote agricultural innovation requires coordinated support from agricultural research institutions, extension services, and education providers while fostering innovation partnerships and links along the agricultural value chains. Altenburg [10] has a similar view; however, he notes three main but differing learning approaches that include:

- a. Learning through increased pressure,
- b. Learning through deliberate knowledge transfers, and
- c. Learning from unintended knowledge spillovers.

Businesses in developing countries are struggling to improve both performance and competitiveness in order to survive, grow, and make profits. According to Humphrey and Schmitz [11], literature in competitiveness suggests upgrading as the most viable approach to make products efficiently and to increase value-adding activities. The cluster literature, on the other hand, suggests that upgrading strategies can work better if facilitated by local governance through networks of public and private sectors that normally support the structure of upgrading.

Upgrading the value chain focuses on changes in the nature and mix of activities [12]. The concept of upgrading aims to replace lower paid activities with those that have higher return. Four types of upgrading, cited in Kaplinsky and Morris (2001), have been discussed in Mwamila et al., [12] including to include the following:

- Process upgrading. This improves the efficiency of internal processes to make the firm more competitive than its rivals.
- Product upgrading. This refers to introducing sophisticated product lines, introducing new products, or improving old products faster than rivals.

- Functional upgrading. This refers to a number of things: adding new functions in the chain (up- or downstream), changing the mix of activities conducted within a firm, or moving from lower return to higher return activities.
- Chain upgrading. This refers to employing the competence gained in one chain to a new and more profitable chain.
- Mitchell, Coles, and Keane [13] note additional upgrading strategies that include:
 - Horizontal coordination. This is a collective structure, typically of a producer group. In developing countries this strategy is acknowledged to be very important for rural people since horizontal coordination allows producers to achieve economies of scale in supplies and reduction in transaction costs.
 - Vertical integration. This strategy moves away from a one-off spot transaction to longer term, inter-nodal relationships. This strategy may result in greater certainty about future revenue flows of the poor producers. The strategy involves building trust between buyers and sellers.

The key capability in upgrading is the capacity to innovate [14]. According to Angel [15], innovation is a management concept promoted by management gurus such as Michael Porter and others. Similarly, disruptive innovation has to make a technological breakthrough: not maintaining the established trajectory of improvement but disrupting and redefining it by bringing a simpler product or service to market. A rate of innovation lower than that of competitors may result in declining firm value added and market share. Therefore, innovation has to be seen in a relative context, i.e., by comparing a company to its competitors.

Two schools of thought have addressed how firms can fare well by upgrading their activities. Hamel and Prahalad (1994), as cited in Kaplinsky and Morris [14], outline the focus on core competences needed to determine those attribute that:

- provide value to the end user,
- are unique, and
- are difficult to copy.

The second school of thought focuses on dynamic capabilities (Teece and Pisano, 1994), also cited in Kaplinsky and Morris [14]. This school argues that corporate profitability, in the long run, is not a sustainable advantage for controlling the market, but one that can only be achieved through the development of dynamic capabilities that arise as a result of the firm's:

- internal processes that facilitate learning,
- position, or
- path, i.e., its trajectory, since change is path dependent.

3. Technology

Technology is defined as the methods, processes, systems, and skills used to transform resources into products. We either speak about technology to imply the commercialization of science or the systematic application of scientific knowledge to new products, processes, or services [16]. Frequently, technology is instrumental in creating innovations and positioning them in the market [17]. Innovation is about a change in technology or a departure from previous ways of doing things. Innovation is divided into two types, namely, product innovation and process innovation. Process innovations are changes that affect the methods of producing outputs, while product innovations are changes in the actual outputs (products and services).

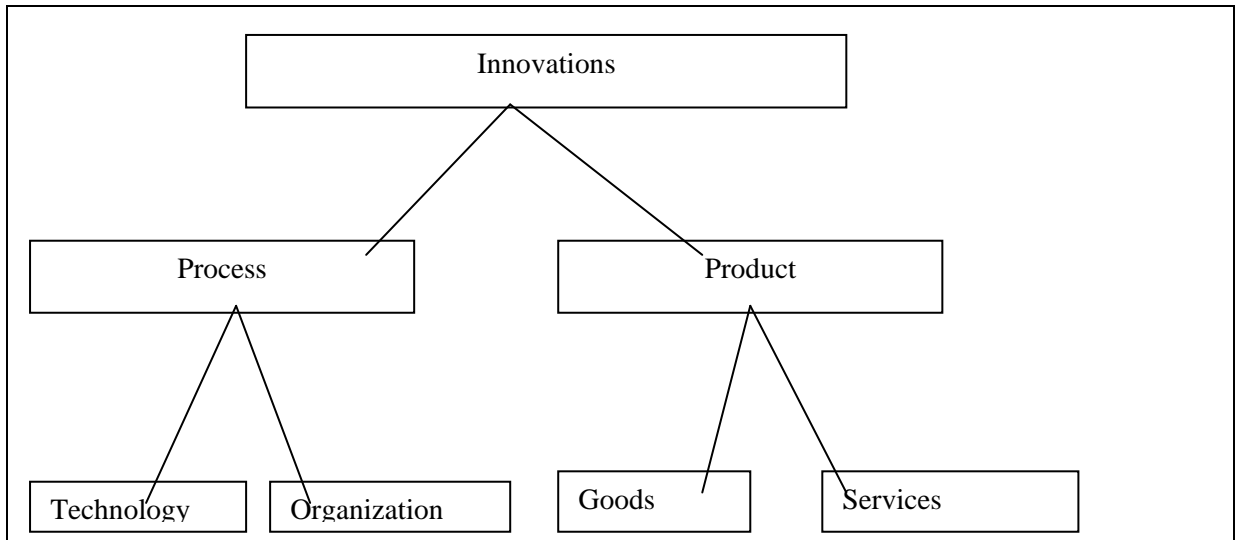


Figure 2: Types of innovations

Source: Innovation systems and innovative clusters in Africa (2004:133)

In Tanzania and other sub-Saharan Africa countries, agricultural technology is basic, as reflected by even the farm tools. It is evident that agricultural production is dominated by outdated or obsolete technology: the hand hoe, the axe, and the use of fire to clear land are still farming tools. Kopoka [18] has the opinion that, for majority of poor rural farmers, the application of new or modern farming techniques and agricultural equipment is very limited. In Kenya, for instance, the number of people living in hunger rose from 16,000 in 1975 to 3.5 million in 2006, partly because farmers were not using modern farming techniques such as the use of fertilizer, pesticides, improved seeds, and mechanization [19].

Globalization of agricultural production from developing countries like Tanzania can help farmers to access new technologies and markets and subsequently compete within the world market.

4. Information communication

The third millennium is challenged with enormous changes in business and professional life. Global warming, international trade, global competition, new technologies, health issues, terrorism, and increased productivity

are among the many changes that accelerated at the turn of the century; however, any success in business depends on the ability to communicate with others [20].

Organizations need to process information to help them make decisions, to communicate policies and procedures, and to coordinate across various units. However, the kind of information sought or heeded or how information circulates, and what information is shared and with whom are likely to reflect cultural preferences for hierarchy, formalization, and participation.

Kohls and Uhl [21] have discussed the roles of market information related to agribusiness that farmers and marketing firms use to improve decision making on production plans, investments, marketing strategies, and operational efficiency in the food industry. Information and communication technology includes a range of telecommunication services, like broadcasting, e-mail, fax, Internet services, computers, televisions, mobile phones, and massive databases [22]. According to Wangwe [23], Africa has the fastest growing rates of mobile and cellular use in the world, but for Internet services, Europe and North America contain 95% of the world's users. Sub-Saharan Africa, with 10% of the world's population, has only 0.2% of the world's one billion telephone lines. The challenges mentioned by DiSanza and Legge [20] make information and communication technology services a prerequisite for socio-economic development to facilitate economic growth in developing countries.

Tanzania had a total of 26,555,057 mobile phone subscriptions as of June, 2013 2008 [24]. Furuholt and Matotay [25] investigated how small scale farmers use their mobile phones in Tanzania. Their purpose was to supply empirical data on the development role of the information technology. Their results show that with improved access to ICT, mobile phones affect positively the cyclic farming life by improving the entire livelihood constructs. There are increased opportunities and reduced risks for rural farmers. However, according to Hassan and Semkwiji [26] there are high preliminary and operational costs involved in owning mobile phones in Tanzania. These costs tend to put at risk the ability other household needs.

The world's stock of knowledge is estimated to double every 10 years and, without proper planning, executives will not be able to solve the complex problems they face [27]. Speed in knowledge creation and sharing information among business managers and stakeholders have become the bases for making decisions and the sources of competitive advantage [28]. Kiplang'at [29] argues that the key to increased production in developing countries lies within the government's ability to disseminate the right information to the farming community. For example, shared information can facilitate the effective adoption of new production techniques, applications of agricultural inputs, pricing decisions, and methods of conserving soil, water, and vegetation resources. Kamuzora [30] is in the opinion that the roles of information, communication, and technology are their catalytic and leveraging effects on earning opportunities, educational services, and welfare provisions.

5. Empirical studies

A number of studies emphasize the importance of value chain linkages in the agricultural sector. Global value chain linkages offer good prospects for actors in the private sector to access knowledge transfers that provide up-to-date and relevant information for agricultural value chain actors in developing countries. However, knowledge transfer is not automatic. Studies of agricultural markets in Zambia underscored some differences in buyers. Humphrey [31] cited the study by Emongor et al. (2004) on the local tomato producers' links with supermarkets and found that the supermarkets interviewed did not provide any technical assistance to their suppliers, except for information on crops the supermarkets wanted to buy and the grades and standards required. In contrast, the same study found that technical support for local dairy farmers from international companies involved in milk processing, such as Parmalat and Finta, collected milk in bulk from collection centers.

Companies in the new age find it advantageous to be vertically integrated. Vertical integration (or vertical linkage) lowers costs [32]. Companies are often then in a position to gain a large share of the added value. In addition, Kotler and Keller [32] argue that vertically integrated firms are in a position to manipulate prices and costs in different parts of the value chain, enabling them to earn more profits when taxes are lowered.

The European agribusiness and food industries are confronted with far reaching changes [33]. According to these researchers, customers in European food markets are becoming more demanding of products and services, so that suppliers have to design better strategies to suit new demands. This has led to reviews of the vertical coordination in food supply chains. For example, in the Netherlands market, chain reversal means that European agribusiness and food industries need to redesign and reposition their activities. Vertical coordination remains the most important factor to improve the competitiveness of the European agribusiness and food industries, as international competition supply chains are increasing. The chain reversal calls for the development of new chain expertise and further analytical methods. In a similar way, Mascarenhas *et al.* [34] have challenged the traditional marketing strategies that assumed customer involvement with products or services takes place only at the end stage of the product or service value chain. They advise managers to involve target customers at all stages of the value chain. This customer-value-chain-involvement model (CVCI) enhances customer relationship management in conjunction with supply chain, employee, and retailer relationship management. Worldwide agribusiness sectors are moving towards closer vertical coordination [35]. Findings from these researchers cite technological, regulatory, social, and economic dimensions as key drivers that affect transactions and product characteristics in the closer vertical linkages.

With globalization, businesses that wish to maintain and improve their competitiveness, flexibility, and capacity to meet the market demands are encouraged to establish good relationships with business members. Agricultural history is full of the continuing struggles of farmers against the abuses of middlemen [21]. Taking the case of the oilseeds industry in Tanzania, small-scale farmers are faced with a number of problems caused

by weak horizontal linkages, such as a lack of or weak cooperatives. The problems include underdeveloped technology, low private sector investments, low and unstable farm gate prices, and low prices of processed oil products [36]. Cooperatives are organized entities that provide a range of services, such as helping farmers to sell products and purchase agricultural inputs. A study of the Canary Islands' food industry found that 53 firms had developed inter-organizational linkages. In terms of the value chain, activities that were most prominent in the relationship were distribution and supplies [37]. Welsh [38] supports that premise:

Structural change in U.S. agriculture in part has been characterized by shifts in control over agricultural production decisions from the farm-level to off-farm firms. In the past decade, this process has accelerated as increasing concentration in production and processing has led to increased vertical integration and contract production. To retain control, some farmers have formed bargaining units, have created production and marketing networks, and have petitioned sub-national state governments for regulation of production contracts. Concurrently, there has been an impressive increase in alternative marketing outlets linked with smaller-scale production based on farm-level control over production decisions.

In the same way, Australian grain growers were faced with the challenges of adding value both to the output of their members and to the services offered to their members. To unlock the problems, customers suggested the importance of trust and the value of forging close relationships among stakeholders over time [39].

Results from a survey of Narayan *et al.* (2001), cited in Marshall [40], on the influence of social capital suggest that social capital is most profound in facilitating relationships of different social units and external allies. Without connections between social capital of poor communities and external allies, poor communities will remain poor. Marshall [40] also cited Cleaver (2005) who argues that governments, as policy makers, need to proactively help small-scale farmers and rural enterprises to forge relationships with other parts of the world.

6. Conclusion

There are several implications for upgrading some specific segments of the value chain. Value chains enhance income gains as the available opportunities help to improve products, develop more efficient production methods, and move into more skilled activities [41]. A value chain helps to identify what actually facilitates or prohibits the growth and distribution of social and economic benefits in a particular subsector [42].

To achieve better earnings, especially for small-scale farmers in developing countries such as Tanzania, local relationships must improve. These critical relationships are centered among the local enterprises, support institutions, and others who connect local actors with global customers. The small-scale farmers feed the supply chains governed by powerful global actors [43]. Schmitz discloses critical areas necessary for enterprise upgrading. The areas include: management skills, equipment purchase and use, quality systems, and human development. Pietrobelli and Rabellotti [6] point out that institutions engaged in the provision of services for the purpose of upgrading local enterprises include business development services providers (BDS). However, some researchers cast doubt on the effectiveness of BDS because of the limited role they play in

promoting technological innovation and management change. Discussions have focused on alternative approaches that include the availability of local specialized service providers.

7. Methodology

A quantitative research design was employed in generating empirical data for this study. The study was conducted in the Singida region in Tanzania. Singida is recognized as one of the leading sunflower producing regions in Tanzania [1].

The government of Tanzania, through its cooperative development policy [44], focuses on upgrading disadvantaged groups such as small-scale farmers to engage in gainful employment of the landless, women, youths, and craftsmen. The role of the government for the last ten years has been that of facilitator or catalyst with an emphasis on information provision, sensitization, education, training, inspection, and supervision. Initiatives try to stimulate stakeholders in agricultural sectors such as Agricultural and Marketing Cooperative Societies (AMCOs) and other non-farm businesses to develop the agricultural industry to access channels that pay better returns. The study focused on how small-scale sunflower farmers in the Singida region of Tanzania engage in upgrading and whether that had an impact on the development of the sunflower subsector. The survey was conducted in twelve AMCOs with 229 respondents.

Table 2: Singida Districts covered in the survey

Categories	Frequency	Percentage
Singida urban	73	31.9
Singida rural	92	40.1
Iramba	24	10.5
Manyoni	40	17.5
Total	229	100.0

Source: Field data 2011

Table 3: Gender

Categories	Frequency	Percentage
Male	162	70.7
Female	67	29.3
Total	229	100.0

Source: Field data 2011

Table 4: Age of Respondents

	Frequency	Percent
18 -20	18	7.9
21 -30	46	20.1
31 -40	83	36.2
41 -50	59	25.8
51 -61	15	6.6
61 +	8	3.5
Total	229	100.0

Source: Field data 2011

8. Operationalized constructs

Fromm, in Working Paper Number 64 [45] on upgrading by small agricultural producers in Honduras, suggests the importance of constructive engagement between local agricultural producers and others in the value chain, such as local producers, exporters, and international players in the sector. He narrates variables like new knowledge and skills acquisition, technological transfers, trust relationships and coordination, and compliance with standards. The following were topical issues investigated using questionnaires.

8.1 Transmission of capabilities

Mitchell, Coles, and Keane argue that “Upgrading means acquiring the technological, institutional and market capabilities that allow resource-poor rural communities to improve their competitiveness and move into higher-value activities” [13: 2]. The World Economic Forum [46] reports on the relevance of core business capabilities in the achievement of the Millennium Development Goals (MDGs) to help halve hunger in Asia and Africa. Several programs in Africa and Latin America have been established to upgrade small-scale farmers to become linked to the local, regional, and global markets. In South Africa, Pick ‘n’ Pay and the Black Empowerment Fund have provided an opportunity for community projects growing fresh produce to reach Pick ‘n’ Pay quality standards. Pick ‘n’ Pay provides a guaranteed market for produce and for ongoing mentoring. In Brazil, Nestle has been providing free technical assistance to over 300,000 farmers supplying fresh milk to its factories in Chile, China, Colombia, India, Mexico, and Pakistan. According to Ambrosini, Johnson, and Scholes [47], organizations need to understand their strengths to be able to compete successfully in the rapidly expanding world economy. Prahalad and Hamel [48] suggest that the core competence of any organization lies in collective learning, especially in the coordination of diverse production skills and the integration of multiple streams of technologies.

8.2 Availability of physical infrastructure and high quality inputs

The need for all-weather infrastructures for agricultural development is widely recognized by many people in developing countries, especially those in Africa, Latin America, and Asia. Infrastructures like roads, electricity supplies, telecommunications, and other services are limited in rural areas. Many researchers agree on the

importance of stimulating agricultural investment and growth by developing infrastructures [49]. Infrastructures not only provide linkages to the market but also help to distribute farm implements and other agricultural inputs to rural farmers.

8.3 Horizontal and vertical integration

Mitchell, Coles, and Keane [13] have proposed seven upgrading strategies for the rural poor.

8.4 Horizontal integration

This strategy of upgrading is more relevant for poor people in rural areas because coordination with small-scale farmers, for example, allows producers to achieve economies of scale in supplies and to reduce transaction costs. This is argued to be the first step in a sequence of interventions that result in access to the market.

8.5 Vertical integration

This is concerned with moving away from one-off spot transactions on the way to longer-term inter-nodal relations. This form of upgrading is important because it paves the way for greater certainty about future revenue flows for value chain actors. Practical findings show that vertical coordination is often a slow and difficult process because it involves building trust between buyer and seller [13].

9. Data collection

A sample consisting of 229 small-scale farmers was randomly selected from a population of small-scale sunflower growers drawn from twelve (12) AMCOs from all four districts of the Singida region. Data included both secondary and primary sources. Data from secondary sources were drawn from various government reports, journal articles, books, and newspapers related to value chain theory. The primary data were collected using a questionnaire administered to 229 small-scale sunflower farmers. The questionnaire was translated into Kiswahili before it was administered to respondents.

10. Findings and discussion

The following section presents findings based on the analysis of the quantitative data (Tables 5) generated from the study area (Singida region). The questionnaires were distributed to 229 respondents, 70.7% were men and 29.3% were women, drawn from four districts. The respondents' ages ranged from 21 to 50 years.

11. Data analysis

Table 5: Upgrading small scale farmers into the sunflower value chain

Variables investigated		Totally disagree	Disagree	Neutral	Agree	Totally agree	Don't Know
Sunflower buyers are more effective in transmitting the capabilities required to compete in the market.	F	183	19	1	8	11	6
	%	79.9	8.3	0.4	3.5	4.8	2.6
Improvement of the sunflower subsector could only be made if buyers and suppliers respect and trust each other.	F	4	0	1	81	133	10
	%	1.7	0	0.4	35.4	58.1	4.4
A lot of knowledge, skills, and technical assistance are transferred along the value chain from sunflower buyer to the unskilled producer. Such knowledge is critical for enhancing the ability of local people to compete.	F	1	2	1	70	144	11
	%	0.4	0.9	0.4	30.6	62.9	4.8
Upgrading small-scale farmers by adopting new sunflower seed varieties and technology into the sunflower value chain has increased profitability, output, and employment.	F	1	3	2	17	193	13
	%	0.4	1.3	0.9	7.4	84.3	5.7
To ensure that sunflower farmers receive a price premium for high quality products, it is important to strengthen vertical information flows.	F	2	2	2	15	197	11
	%	0.9	0.9	0.9	6.6	86	4.8
The bargaining power of sunflower associations relative to buyers can be enhanced by improved farmers' knowledge of markets, prices, and quality.	F	1	3	2	9	203	11
	%	0.4	1.3	0.9	3.9	88.6	4.8
Physical infrastructure and social isolation of small-scale farmers limit market information flows and increase transaction costs.	F	0	4	1	12	197	15
	%	0	1.7	0.4	5.2	86	6.6
Diversification of sunflower market channels helps farmers manage risks.	F	10	10	1	15	181	12
	%	4.4	4.4	0.4	6.6	79	5.2

Source: Field data 2011

Agribusiness bears Multiple factors attributes that have high potential for value addition of agricultural products in developing countries. Agribusiness features in the three main sectors of the economy of any country, which are; industrial, agricultural and service sectors. The agribusiness sector in Tanzania which largely constitutes actors in the agriculture still remains largely informal. The sector requires transformation to equip the majority of Tanzanians with both soft and hard infrastructure to cater for small holder farmers.

At the start, sunflower farmers were asked to give their views on whether sunflower buyers are more effective in transmitting the capabilities required to compete in the market. The categories of answers ranged from “totally disagree” to “totally agree” to “don’t know.” Disagree answers meant that buyers did not transmit the capabilities, i.e., subsector-specific skills, relationships, and organizational knowledge to make small-scale farmers competitive in the market for sunflower seeds: out of 88.0%, 8.3% “disagreed” and 79.7% “totally disagreed.” As to supporting small-scale farmers by adopting new inputs like sunflower seed varieties and farming technology, farmers were asked to provide their views on whether the initiatives helped to increase profitability, output, and employment. About 91.7% of the respondents were “satisfied” with the way the use of new varieties and farming technologies can be used to increase output, profitability, and employment. Out of that 91.7%, 7.4% “agreed” and 84.3 % “totally agreed.”

Respondents were also asked about improving the sunflower subsector through better collaboration between buyers and suppliers. Regarding the role of respect and trust between buyers and sellers; 93.5 % of respondents supported the statement (35.4% “agreed” and 58.1% “totally agreed”).

As to the need to ensure that sunflower farmers receive price premiums for high quality products, it is important to strengthen vertical information flows between sunflower sellers. The value chain system must transmit information to producers about consumer preferences, and about the likelihood of farmers’ prices being associated with consumer preferences [50]. Farmers were asked to provide their opinions on the relationship between price premiums for high quality products with the strengthening of vertical information flows. About 92.6% saw the need to strengthen the information flow in order to receive increased price premiums for the better quality sunflower seeds.

Furthermore, analysis was performed to understand the bargaining power of sunflower associations relative to the buyers to find out if improving farmers’ knowledge of markets, prices, and quality would enhance it. Working Paper No. 5 [51] by Tanzania Agriculture and Food Security Investment Plan (TAFSIP) discusses the need for groups like associations or cooperatives to be empowered to respond to the market opportunities at regional and international levels. This particular paper suggests development issues such as improving the poor bargaining power among farmers and agricultural marketing cooperatives and associations through improved market information. About 92.5% supported (88.6% “totally agreed” and 3.9% “agreed”) upgrading small-scale farmers by empowering associations to have bargaining power through enhanced information flow.

With respect to the statement of whether physical infrastructure and social isolation of small-scale farmers limit market information flows and increase transaction costs, 91.2% supported the statement. The construction and improvement of roads and market infrastructure are significant for input organizing and output marketing. These enhance competitiveness of agricultural products by lowering the marketing cost and preserving the quality of the products [51]. Finally, the issue of whether the diversification of sunflower market channels helps farmers manage risks was investigated. About 85.5% of respondents fully supported the statement, 6.6% “agreed” while 79% “totally agreed” with the statement. Diversification is a way by which a business expands from its core business into other product markets [52]. A number of studies indicate that on average, diversified firms show better performance compared to undiversified firms on both risk and return dimensions

[53]. The World Bank [54] also indicates that agricultural diversification has had positive results such as income generation and increased employment. Von Braun [55] reached similar conclusions, finding that as a result of diversification in the export of vegetable production in Guatemala, employment increased by 45%. The use of agricultural inputs translates to improved agricultural technologies to help farmers address challenges such as lower productivity, declining soil fertility, pests, diseases and weeds. The sunflower output in Singida region shows an upward trend in 2005/06 and this is evidenced mainly from the yield, due to subsidization of the inputs such as seeds and fertilizer inputs by the government. In addition, there is an intensification of extension and marketing services by both the government of Tanzania and development partners [3].

12. Interpretation and conclusion

This study on the effects of upgrading Tanzania's small-scale farmers into sunflower value chain systems analyzes investigated topics with relation to value chain and upgrading theory. The study yielded a number of insights, taken from feedback from sunflower growers in the Singida region.

First, in regard to the importance of the sunflower subsectors and the value chain upgrading, it is overwhelmingly clear that the successful design and delivery of the sunflower subsector development hinges on the facilitation of upgrading strategies. The subsector has favorable potential for improving the economic well being of farmers and others in Singida region. For this study, sunflower agribusiness performance may be further developed if the investigated topics (Table 5) are adequately addressed and implemented, as reflected in value chain theory. Regarding the crucial topics and value chain upgrading, the respondents had positive opinions on the creation of core competence of the subsector. Respondents concluded that adopting new capabilities for small-scale farmers, especially by providing tangible assets such as extension officers, financing, warehouses, and technology (e.g., varieties of new seeds and machinery), could lead to improved productivity and quality. The information flow from sunflower buyers or consumers is crucial to creating a positive image and hence creating added value to farmers. Farmers require capabilities in negotiating with buyers, and this could be done through improved associations or cooperatives. Respondents also indicated positive benefits if the sector is further diversified, as it will help to spread risks and improve income and employment to farmers.

Theoretically, this study proposes a strong positive influence of upgrading variables on sustainable income growth of sunflower sub sector, however; in facilitating the small scale farmer productivity and value addition along the agricultural value chain, service providers should improve

- Provide capabilities and necessary resources, such as subsector specific skills, relationships, knowledge, finances, agriculture extension officers, new technology, new varieties of seeds, and facilitation of information flow that are inputs to the sunflower subsector's upgrading processes.

- Form strong, capable, and cohesive associations or cooperatives that can enhance bargaining power for small-scale farmers.
- Improve infrastructure such as roads and warehouses. It appears that many small-scale farmers who live in rural areas are isolated from getting necessary information and also incur higher transaction costs when they try to sell their sunflower seeds.

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